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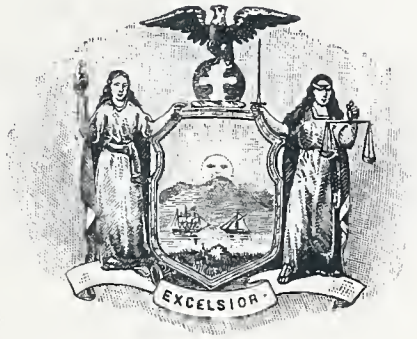
State of New York.



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STATE OF NEW YORK.

DEPARTMENT OF PUBLIC INSTRUCTION



ARBOR DAY,

MAY 3, 1895.

Chapter 196.

AN ACT TO ENCOURAGE ARBORICULTURE.

APPROVED April 30, 1888

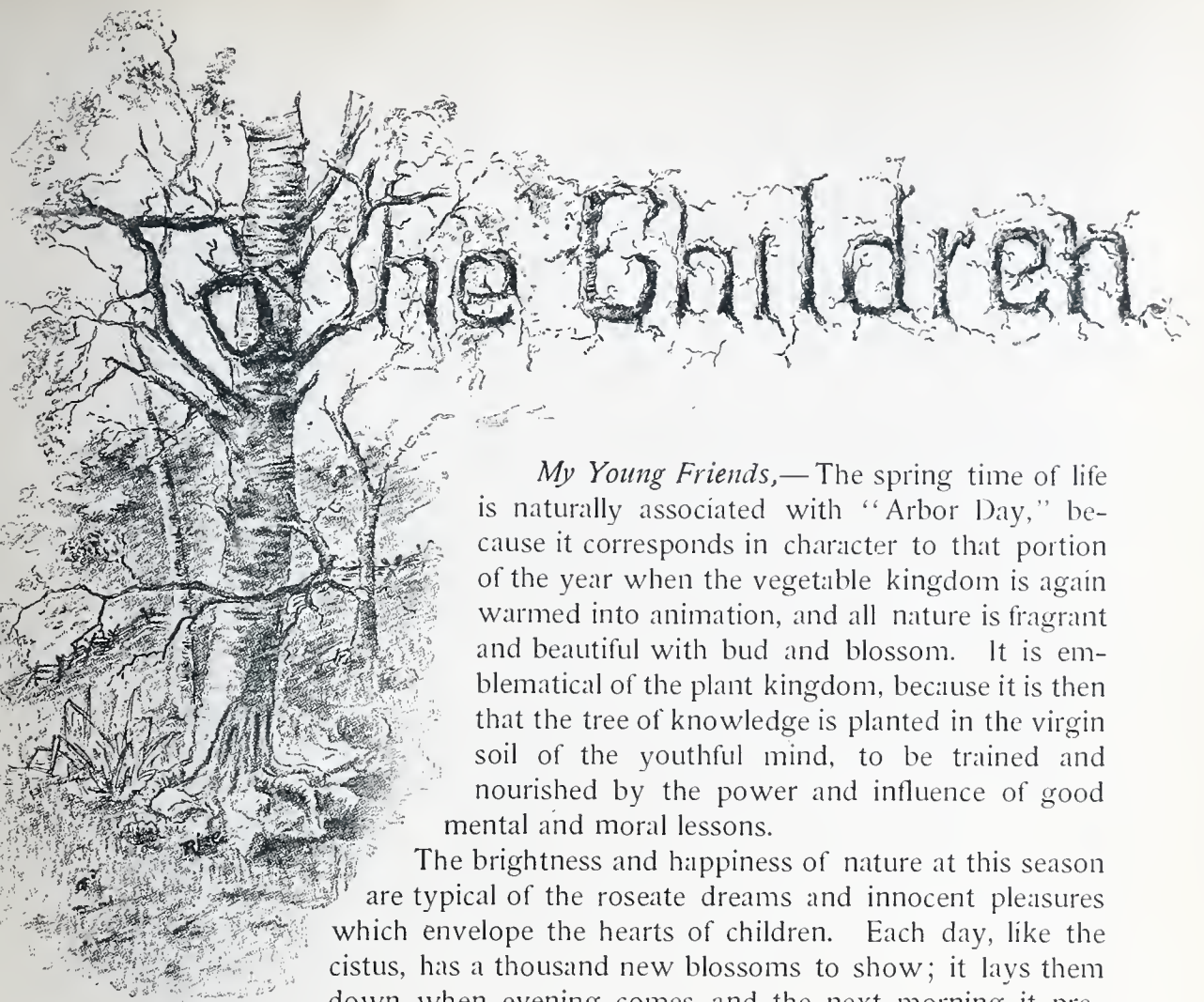
The People of the State of New York, represented in Senate and Assembly, do enact as follows :

SECTION 1. The Friday following the first day of May in each year shall hereafter be known throughout this State as Arbor Day.

§ 2. It shall be the duty of the authorities of every public school in this State to assemble the scholars in their charge on that day in the school building, or elsewhere, as they may deem proper, and to provide for and conduct, under the general supervision of the city superintendent or the school commissioner, or other chief officers having the general oversight of the public schools in each city or district, such exercises as shall tend to encourage the planting, protection, and preservation of trees and shrubs, and an acquaintance with the best methods to be adopted to accomplish such results.

§ 3. The State Superintendent of Public Instruction shall have power to prescribe from time to time, in writing, a course of exercises and instruction in the subjects hereinbefore mentioned, which shall be adopted and observed by the public school authorities on Arbor Day, and upon receipt of copies of such course, sufficient in number to supply all the schools under their supervision, the school commissioner or city superintendent aforesaid, shall promptly provide each of the schools under his or their charge with a copy, and cause it to be adopted and observed.

§ 4. This act shall take effect immediately.



My Young Friends,—The spring time of life is naturally associated with “Arbor Day,” because it corresponds in character to that portion of the year when the vegetable kingdom is again warmed into animation, and all nature is fragrant and beautiful with bud and blossom. It is emblematical of the plant kingdom, because it is then that the tree of knowledge is planted in the virgin soil of the youthful mind, to be trained and nourished by the power and influence of good mental and moral lessons.

The brightness and happiness of nature at this season are typical of the roseate dreams and innocent pleasures which envelope the hearts of children. Each day, like the cistus, has a thousand new blossoms to show; it lays them down when evening comes and the next morning it presents as gay a show of flowers as ever.

Happiness sweeps over the youthful, budding mind with its gay and alluring illuminations just as the strong, swift sunshine throws its unimpeded warmth and light over hill and dale, land and sea.

Therefore, my young friends, it is an especial pleasure for me to speak a few kind words to you on “Arbor Day.” Did it ever occur to you that you form an army numbering nearly two million young soldiers, all marching under the broad banner of education and officered by nearly thirty-five thousand teachers? This army is the chiefest care of the State, for its mission is to battle against the State’s most dangerous enemy, ignorance. Have you ever reflected that on you the State depends to carry out in the near future its grand projects of material, industrial and educational development, and that the reins of government and all branches of business will, in a short time, be placed in your hands? Do you realize the fact that the custody and ownership of all the great and varied interests of this immense commonwealth is being gradually committed to your care? As the heirs of individual households succeed to the possessions of parents, so the youth of the State succeed to the possessions of the State’s wealth and numerous business interests. The whole management must eventually devolve upon the children of the State. All positions, offices of trust, both private and public, must be transferred to you. The farmers, the mechanics, the merchants and bankers, the railroad managers, the governors, judges, and all other public officers, the

ministers of the gospel and the teachers must surrender their places to the children now in school.

The management of all the varied interests of the State, her political, social, and religious trusts, her agricultural, commercial and inventive interests must be handed down gradually to her youth. Are you fitting yourselves to meet and properly perform these responsible duties for yourselves and for the State? As the mother of the Gracchi said of her sons, "These are my jewels," so the Empire State proclaims to the world through her unstinted liberality towards the schools that she regards you as the brightest jewels in her diadem of Empire. Are you doing all you can to prepare yourselves to make a fitting return for her love and care?

Now is the time to do it. If this precious season of preparation and probation is wasted or neglected, the hopes of the "Empire State," placed on her children, are not likely to be realized. I do not believe the boys and girls of New York will disappoint those who are looking forward with confidence and hope, in the performance of these important events.

The opportunities for obtaining an education were never so grand as at the present time. The school period of your lives is short, at the longest. Waste no time in idleness while these opportunities are offered to you, for which, in later years, you will have deep regret. Each of you must bear in mind that by education there is a brightness which may be yours in adult life, a distinct splendor and characteristic loveliness of mind by which you may be one day known, admired, and loved amid the populous throngs of this great world. You are the flowers of the garden of the State, blossoming and giving forth fragrance only in proportion to the care which is bestowed upon your minds and hearts. Education is the fountain from which these graces and qualities of beauty flow. Through your industry and determination to avail yourselves of its advantages, you will create for yourselves in the future a thousand Edens, even in the bleak expanse of this selfish world, and make your paths less rugged and your surroundings less drear whatever may be your lot in life.

Education, rightly appreciated, deeply imbibed, and diligently pursued, is the best preparation for the fulfillment of your various duties in adult life. It forms the character, stimulates the intellect, engrosses the affections, absorbs all faults and becomes, to a great extent, the measure of failure or success.

And now, on this May festival, when all the schools are doing homage to the most interesting of dumb nature's children, the trees, and when the chief favorites of her numerous family, the flowers, are beginning to peep out after their long winter sleep, I wish to say a few words to you on these silent though beautiful wonders of nature. You may gather many valuable lessons from trees. Listen to the words of the inspired Ruskin, one who has studied them carefully and lovingly and whose thoughts on the trees and the beautiful are full of fruitful instruction. "The resources of the trees are not developed until they have difficulties to contend with; neither their tenderness of brotherly love and harmony till they are forced to choose their ways of various life when there is contracted room for them, talking to each

other with their restrained branches." "The various actions of trees rooting themselves in inhospitable rocks, stooping to look into ravines, hiding from the glacier winds, reaching forth to the rays of the rare sunshine, crowding down together to drink of sweetest streams, climbing hand in hand among the difficult slopes, opening in sudden dances around the mossy knolls"—are they not replete with lessons to you, my young friends? The more perplexing the obstacles you meet on your way, the more energetically you should labor to overcome them. The more difficult the problems of life you have to solve, the closer and more persistent should be your attention and purpose. The more discouraging your surroundings, the more penetrating the chill of disappointment, the quicker you should take refuge in industry and hopefulness to gain the success that is open to you all. The strength and enjoyment that come from human effort are typified in the struggle, success, and beauty of the various specimens of tree life.

There are many beautiful lessons to be gathered from flowers. I would first present to you the daisy with its modest crimson-tipped blossom, which teaches in a silent way the virtue of patience. Now, look upon this herald of the flowers, the snowdrop, "sent with its small white flag of truce" to plead with winter for its beleaguered brethren. It typifies hope. Next comes that bright little flower, the crocus, the embodiment of cheerfulness. You all know that the beautiful violet stands for modesty and the rose for love, joy, and purity. The heliotrope is the emblem of devoted attachment, the jasmine of amiability, the poppy of consolation, the honeysuckle of generous affection, the sunflower of fidelity, the laurel of glory, the hearts'-ease of remembrance, the marigold of grief, the lily of majesty and purity, the fuchsia of good taste, the amaranth of immortality, the lilac of the joys of youth, and the passion-flower of faith. Are not these charming little children of plant nature, eloquent in their various meanings and the lessons they teach?

There is one beautiful flower which I trust my young friends will cherish with its touching legend. It is the forget-me-not, and I hope that every boy or girl in the State who may be called at some future time to take the position of a superintendent, teacher, or some other equally responsible one, may wear upon his or her breast this sweet emblem of affection in memory of some dear and faithful teacher.

With much love, I am,

Yours sincerely,

J. F. CROOKER.





NATURE'S AWAKENING

Said the sun unto the tree-buds,
One day in the early spring,
"You've lain so long and slumbered,
It is time to wake and bring
Joy and gladness, mirth, not sadness,
To the hearts of all mankind,
And to cheer the eyes of many
That to all things else are blind."

First, the little pussy-willows,
Growing close beside the brook,
Whispered one unto the other,
Do you see how bare things look?"
"Now we're sure spring is not perfect
Till we don our coats of fur,
Then we'll look so much like kittens,
They can almost hear us purr."

Then the summons reached the willows,
Which grew by the running stream;
And their branches, full of vigor,
Quickly donned their robes of green.
And the maples, looking at them,
Said, "We, too, must soon be out,
For the birds will now be coming
Just to see what we're about."

So, our boughs must not be naked,
But clothed in their robes of state,"
And the buds that heard them, whispered
"We will surely not be late."

Soon the elm tree and the beeches,
With the birches, fair and tall,
And the feathery, fragrant locust
Also answered to the call.

And the gently stirring branches,
Seemed to whisper, low and deep
"If the birds will seek our shelter
We will rock their babes to sleep."
When the birds came flying hither
With the spring's refreshing breeze,
Their songs were those of thanksgiving,
Unto Him who made the great trees.

SARAH C. FLINT.

HOW TO KNOW TREES.

BY AUSTIN C. APGAR.

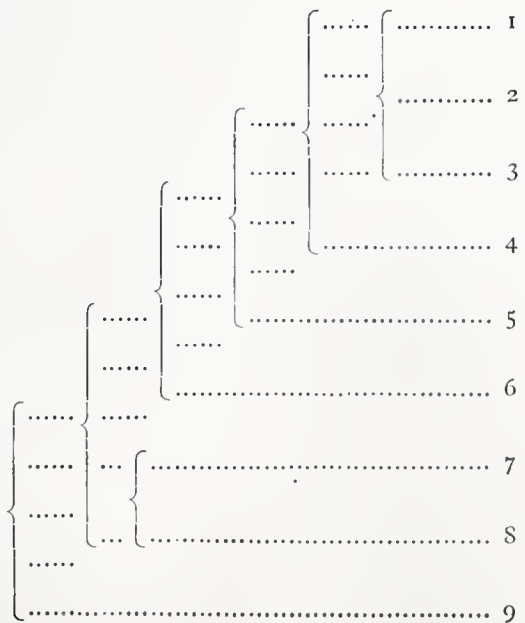
Author of "Trees of the Northern United States."

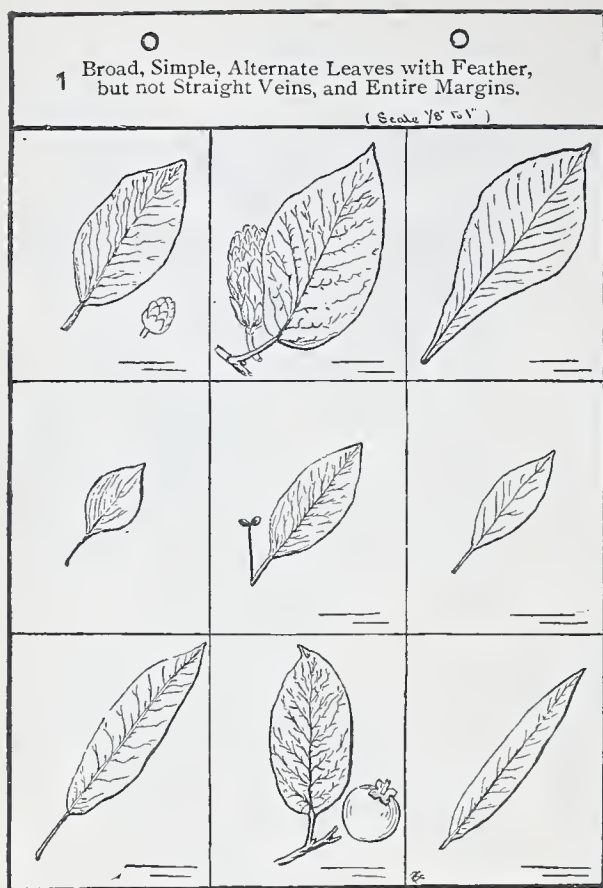
INDEX of the TREES WITHIN A MILE OF Our School.

Arbor Day, when in all the schools we are talking and singing about the beauties of nature in all her forms, and especially about the grandeur, the stateliness, and the usefulness of the trees, is a good time for us to resolve to know the different kinds of trees in our neighborhood. No one can appreciate much without knowing much. First, we must know trees by name, and, gradually, we will learn to know many interesting things about each in regard to the time when the buds burst in the spring, when the blossoms are to be found, when the fruit

is ripe, when the leaves fall, all the changes in color of foliage that take place during the year, etc. The day we first know a tree by name will be the day when our interest and enjoyment in that tree will begin.

The plan here described of forming an "Index of Trees" will enable the pupils and teacher of each school to easily and gradually become acquainted with their trees. It consists of pressed leaves of all the kinds of trees in their neighborhood fastened to Bristol boards. These can all



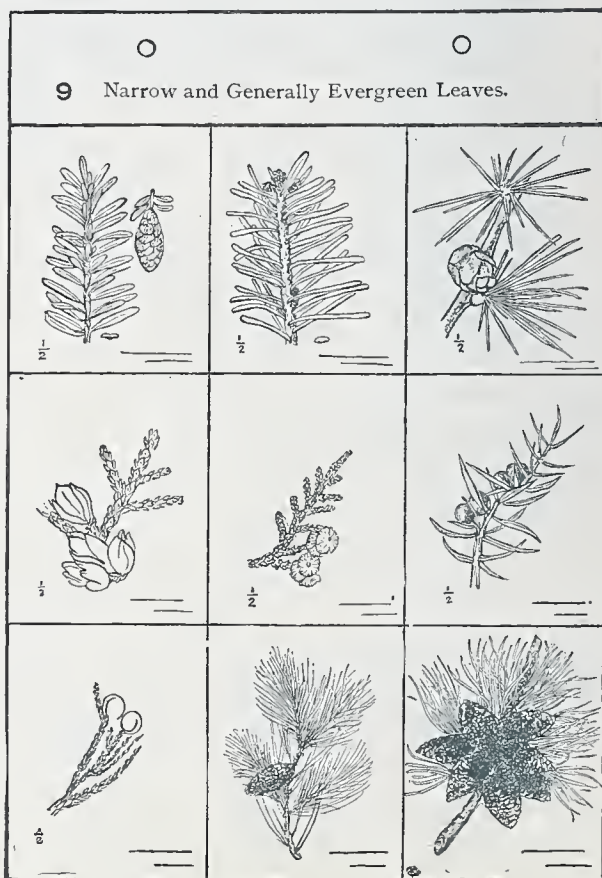


be placed over each other for protection from dust and light when not in use and can be spread out separately when needed for reference or study. At the right and below each kind of leaf is placed the name of the tree, the place where the particular tree grows from which the specimen was taken, and the name of the student who first found it.

The first card of the series contains a statement of the ground covered by the collection and of the peculiarities of the leaves to be placed upon each of the other cards. It is quite important not to undertake to make your collection cover more ground than can readily be visited and explored by all the pupils. In the figures

illustrating the plan, the area included is that of a mile in all directions from the school building. The best region to take would of necessity vary according to the locality, but the one given would be a good one for most country districts. In the larger cities it would probably be best to take the trees of some convenient park. In smaller towns, those found along the streets and in the private grounds within the town limits would probably give a good field for investigation.

The number of species to be found in such a section would vary from about thirty to something over one hundred. The number would usually be greatest in small



towns and villages, where the grounds around the houses generally contain quite a large number of cultivated species, and smallest in country farming districts. Whatever area is decided upon should be strictly adhered to, and it would always be best to limit it to a rather small and convenient one. After a year or two, when the small section has been thoroughly worked up, a more extended one could be taken and the new trees added to the collection.

An index, to be useful, must have its parts arranged by some scheme readily comprehended by those for whom it is intended. The basis of classification in this plan is what the leaf itself shows. The form, the arrangement on the twig, the veining, and the edge determines the card to which the leaf belongs, as will be readily seen by an examination of the synopsis :

{ Broad leaves	{ Simple	{ Alternate	{ Feather veined	{ Not straight veined	{ Entire margin . . . 1 Notched margin . . . 2 Lobed Margin . . . 3			
		{ Opposite 5	{ Radiately veined 6	{ Straight veined 4				
		{ Opposite 7						
	{ Compound							
	{ Opposite 8							
						{ Narrow leaves—Needle, Scale or Awl shaped, <i>usually evergreen</i> , 9		

With the specimen in hand the student first decides whether the leaves are *broad* or *narrow*; if broad, then if *simple* or *compound*; if simple, the next point to be determined is the arrangement on the stem, whether *alternate* or *opposite*, and so on through the scheme till the number of the chart which ought to have the specimen is reached.

Besides the statement on the cover card, each card needs a condensed statement of the kinds of leaves to be found upon it. A careful investigation of the native and cultivated trees of the State of New York shows that the plan given divides the trees of most localities into quite equal divisions. In but a few cases would more than nine species be found belonging upon a given card; where such a case occurs, another card with the same number and the word "continued" should be provided for the other species.

The statements to be placed at the top of each of the cards are as follows:

- 1.—Broad, simple, alternate leaves with feather, but not straight veins, and entire margins.
- 2.—Broad, simple, alternate leaves with feather, but not straight veins, and notched, but not lobed margins.
- 3.—Broad, simple, alternate leaves with feather, but not straight veins, and lobed margins.
- 4.—Broad, simple, alternate, straight veined leaves.
- 5.—Broad, simple, alternate, radiately veined leaves.
- 6.—Broad, simple, opposite leaves.
- 7.—Compound, alternate leaves.
- 8.—Compound, opposite leaves.
- 9.—Narrow, generally evergreen leaves.

The application of the terms given can readily be learned by an examination of the cards shown in the heading of this article or by the study of any of the leaves for each card as shown in the following list: The magnolias,

laurels, sour gum, persimmon, quince, and willow oak belong on card 1; the holly, cherry, apple, pear, plum, and willow on card 2; the tulip, sassafras, and white and red oaks on 3; elms, birches, elders, ironwoods, chestnut, beach, and chestnut oaks on 4; lindens, Judas-tree, sweet gum, sugar-berry, mulberries, buttonwood, and poplars on 5; the common dogwood, the maples, and the viburnums on 6; the sumachs, locusts, mountain ash, walnuts, and the hickories on 7; horsechestnut, true ash trees, and box-elder on 8; spruces, firs, hemlock, pines, arbor-vitae, cedar, and juniper on 9.

Pressing the Specimens.—A board about a foot wide and sixteen inches long should be procured to place over the pile of pressing pads, and also a dozen bricks tied up in four packages for weights. The best pressing pads are made from folded sheets of untarred carpet or building felt, but large newspapers folded once across the page, giving a size of about twelve by sixteen inches do very well. Some thin pieces of common printing or other unsized paper are also needed. A few newspapers or pads are first placed on the floor or table where the pressing is to be done; then a leaf of some tree is placed upon a piece of the thin paper on which is written the necessary information about it; such as the arrangement of the leaves on the twigs, the tree from which the leaf is taken, and the name of the pupil who brought it. As many of such thin papers and their leaves are placed on the pads as can be arranged so as not to overlap each other. Two or three pads are placed over the leaves thus arranged, then a new lot of leaves, and again a few more pads. On the top of the last lot the board and weights are placed as shown at the end of this article. After twenty-four hours the leaves, still remaining on their thin sheets of paper, are transferred to a dry lot of pads and the weights renewed. After another day a new lot of dry pads are again needed. In about a week the leaves will be ready for mounting. The specimens of evergreens for card 9 are twigs and leaves instead of separate leaves:

Mounting the Dried Specimens.—There should usually be two leaves of each species of tree, so that one can be used to show each surface of the leaf. The large compound leaves can usually be so folded when pressed that both surfaces can be seen of the same specimen. It is better to fasten the leaves to pieces of unruled writing or drawing paper of the proper size, and then fasten these to the Bristol boards. The leaves should be gummed with mucilage on the proper side and neatly arranged on the unruled pieces of paper. If there are two leaves from the same tree, they both should be placed on the same piece of paper, one showing the upper and the other the lower surface. Carefully brush the mucilage over the surface of the leaf, arrange neatly on the paper, and then place in your plant press till dry.

Some species of evergreens, especially the spruces, tend to fall to pieces after they are dry, and these should be covered with mucilage and placed on their proper sheets of unruled paper when first placed in the press. To prevent such specimens from sticking to the pressing pads, old muslin should be spread over them before covering with the pads. In fastening the pressed specimens to the paper, the same plan of covering with muslin will ensure their sticking only to the proper paper.

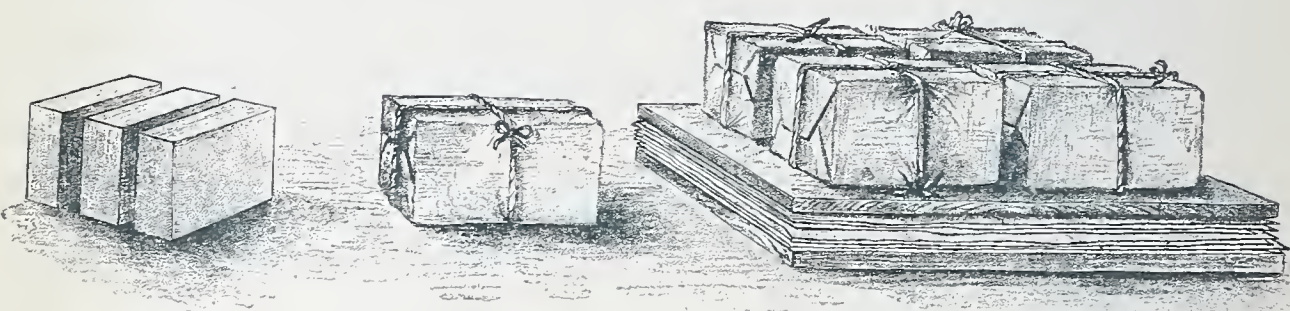
Fixing the Specimens on the Cards.—Rather thick Bristol board should be procured. The thickest commonly sold is what is called 3-ply; this does very well, but 4-ply would be better. The size commonly sold is twenty-two by twenty-eight inches, and works very well for the purpose. The paper-box factories use a board which is cheaper, larger, and better, if you can procure it. It is called Caledonian pulp board. What is called No. 40 (because 40 make a bundle) is especially good for the display of anything a teacher wishes to show on cards. These boards are made as large as twenty-nine by forty-two inches, and would be large enough for the display of sixteen specimens on a card, instead of the nine shown on the drawings. If the usual Bristol boards have been procured, holes, twelve inches apart, should be carefully punched about an inch from the top, the boards numbered, and the proper heading written upon them. If the full size pulp board is used, the holes ought to be sixteen inches apart. First cut the paper on which the leaves are mounted to the proper form and size, and then, pasting merely the corners, fasten on the boards. The proper information, as before given, should now be written in the corner of the paper.

Teachers should not attempt to make a complete collection in too short a time. It would be well if a year or two could be taken for the work, because, if properly managed, all the students in the school can be interested in the work and induced to help in its formation. The less a teacher does personally and the more he induces the pupils to do, the better.

Hanging and Display of the Boards.—At the proper distance apart, twelve or sixteen inches, as the case may be, in some convenient position for study, drive twenty wire nails. All except two, which are to hold the collection when closed, should be quite small and driven in till only about a quarter of an inch projects. This will enable the teacher to display the whole or any portion of the collection he may wish, or to close up the whole upon the two large nails when not in use.

Use of the Index.—The preparation of the “index” is of itself a use of the “index.” Those who help in its formation will learn many things about trees, and have their eyes opened to many of the beauties and wonders of God’s works. After its completion, many plans of lessons will occur to any teacher. 1st. Have leafy twigs brought to the school. Require each student to examine a specimen and compare it with the tabulated statement on the cover board, and decide on which of the cards it belongs. Open to the card decided upon and see if it is there. This will force a close observation of the specimen in hand, ensure an understanding of the terms used to describe leaves, and start the student in the use of those most important adjuncts to all nature works, “keys.” 2d. The pressed and mounted specimens contain a statement as to where the particular tree from which the leaf was taken is growing. This will enable all the pupils to examine the growing tree. Take some kind as a lesson for a week, and have each student report the number and location of all of that species he or she has been able to find. 3d. Have the pupils, when studying, as in the last, a particular kind of tree, tell about the tree as a whole—its general form, its height, the kind of trunk it has, the character of its bark, the way the branches extend from the trunk,

the kind of twigs, and the kind of blossoms or fruit. 4th. After the pupils have become familiar with all the trees of the neighborhood and can call them by their names, require each to make out a complete index. The school index tells where one of each kind of tree is to be found; let the pupil's index tell just where all the rarer species are to be found, and the general distribution of all the common ones. 5th. Give to each pupil the work of watching and keeping a diary concerning a particular kind of tree. He should be expected to note the time of the first bursting of the buds in spring, when the leaves are all out, the bloom, the ripening of the fruit, the first changes in the autumn, the dropping of the first leaves, when the leaves have all fallen, etc.



SOME DESTRUCTIVE SHADE TREE PESTS.

BY J. A. LINTNER, PH. D.

New York State Entomologist.

It seems eminently fitting and proper that in our Arbor-day observance the attention of the young people should be directed not alone to the planting of trees, but to their proper care and protection as well.

It is through ignorance, chiefly, that many young trees, set out with loving care and proper Arbor-day observance and dedication, are left to wither and die before our eyes, in consequence of the depredations of injurious insects. If children can be taught to recognize these insects and some means of exterminating the same, thousands of them might be destroyed every year, and many of our beautiful shade trees saved to a green old age.

In this article we shall consider a few only of those whose depredations are becoming most alarming, and to exterminate which great efforts are being made.

The Elm-leaf Beetle.

The elm, from the beauty of its form, its spreading branches, and the grateful shade it gives us, is, perhaps, the most valuable and highly prized of our shade trees, yet in recent years it has become so subject to insect attack that, unless its more destructive insect enemies are successfully fought and overcome, we shall be obliged to regard it as a doomed tree, and allow it to give place to other more resistant species. Already in some of our eastern cities the English elm is being removed on account of its attractiveness to the elm-leaf beetle and the opportunity that it affords for its multiplication.

This pernicious insect, known in science as *Galerucella xanthomelaena*, belongs to a well-known plant-eating family, and is closely allied in habits and general appearance to the striped cucumber-beetle. A figure of it in its different stages, from its egg up, and its manner of eating the foliage, is herewith given. It was introduced from Europe about fifty years ago, and was first noticed at Baltimore. During the last five years it has gradually extended along the seaboard to New York, where it has already caused the death of a large number of magnificent elms. It has continued to spread slowly northward, and last autumn the first examples of it were seen at Albany. Unless attacked by some efficient parasite it will continue to spread, perhaps over our entire country.

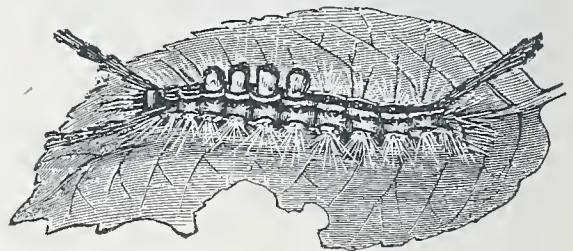
There is but one way known of successfully meeting the ravages of this pest, and that is, by spraying the trees attacked by it at the proper time and in the proper manner, with Paris green or London purple in water, after the manner so often given in our agricultural papers. From the large size of our elms, their efficient spraying is a difficult matter, and it can only be done by means of a powerful force-pump, with its connecting hose carried up into and among the branches.

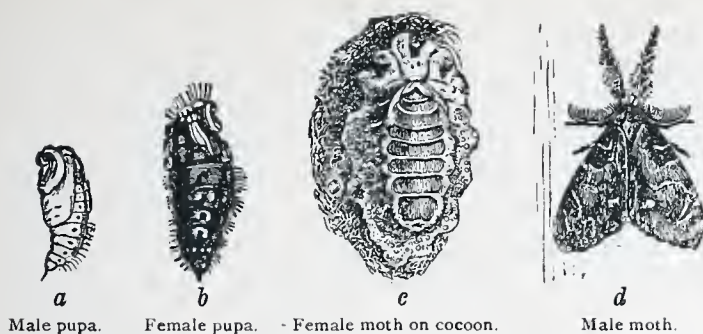


In the figure accompanying, the flask-shaped eggs in a cluster are shown in enlargement at *e*, the young larvæ at *a*, in their natural size at *b*, in enlargement at *g*, the pupa at *j*, and the beetle at *k*. Lines placed beside the figures represent their natural size.

The Orgyia Moth.

The caterpillar of "the white-marked tussock moth," *Orgyia leucostigma*, is one of the most destructive depredators upon the foliage of our shade trees of all our insect pests. Nearly every person is familiar with it, from its abundance everywhere in the early summer of seasons favorable to its increase — hanging from the trees suspended by its silken thread, traveling over sidewalks in search of new feeding-grounds, upon the sides of houses, and creeping within open windows and doors, on the tops of fences, and often with its little feet tickling the neck, as with its proclivity for climbing it seeks the top of the tallest feather on a lady's bonnet. It is a beautiful creature when closely examined, in its bright colors and tufts and pencils of hair, to which its picture (fig. 3) fails to do justice. A farmer, whose attention was drawn to it for the first time in wiping the grass from his scythe, was heard to exclaim — "Well, I declare, that's the most beautiful creature that ever I saw!" But it is very destructive. Not alone does it frequently strip the foliage from the elms, maples, and horsechestnuts, so as to leave our cities with scarcely a vestige of shade, but it entirely defoliates





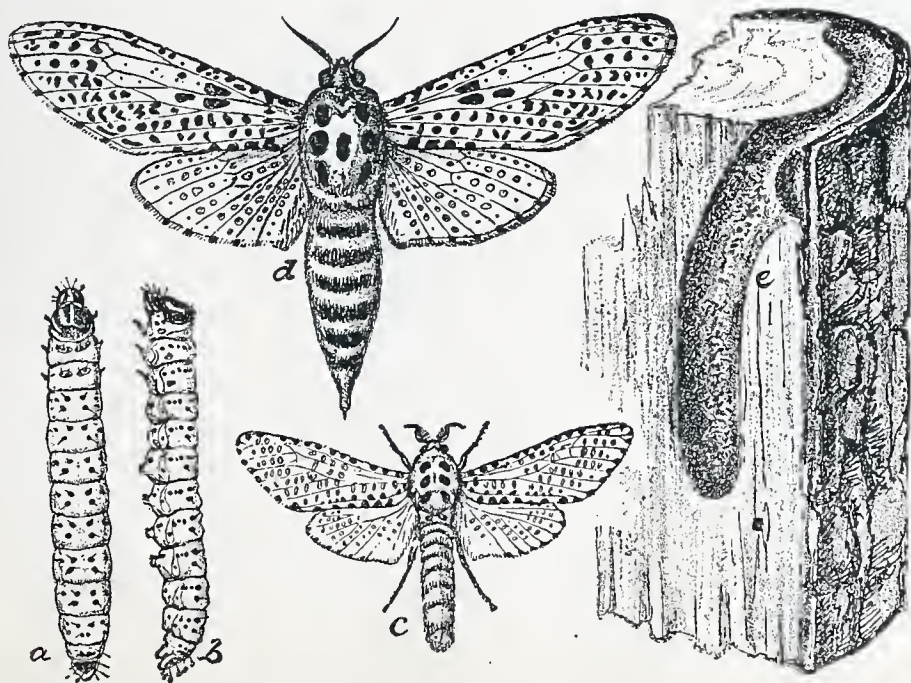
young fruit trees so that their fruit comes to naught. It is widely distributed over the country. It seems to be the most abundant where the English sparrow abounds, for they protect it in driving away the robin and the

few other birds that will feed on hairy caterpillars. New York and Brooklyn suffered greatly from its ravages last year, for there, and southward, there are two broods of it each year, while in Albany there is but one.

The moth produced by the caterpillar is quite inconspicuous in its appearance, particularly the female, which is wingless and never leaves its cocoon until, after laying its eggs, it drops lifeless to the ground. Everyone should learn to recognize at sight these cocoons on the trunks of trees and under cornices, bearing their snow-white, froth-like covering of the egg-cluster on the surface of the cocoon. They are conspicuous objects in autumn, and each one picked off and crushed under foot may prevent the development of two or three hundred caterpillars the coming season. In no better way can the ravages of this insect be prevented than by the easy collection and destruction of these egg-clusters. In Rochester and some other cities, children have been paid a certain sum for each hundred of the egg-clusters brought in to the authorities.

The Leopard Moth.

Another member of the Lepidoptera, which is killing large numbers of elms, as well as maples and other trees, in and about New York City, and



which, we fear, is to spread into the interior, and into other States, is the *Zeuzera pyrina*, known in Europe as the "great leopard moth," from its white wings being prettily marked with many rounded black spots. Figures of it, and of its caterpillar are given herewith, from which it may be easily recognized.

The *Zeuzera* is reported as girdling and boring young maple trees within a few inches of the ground, causing them to break and fall with the wind. In the elms, different species of which it attacks, its operations, so far as observed, are confined to the limbs and branches, which are so weakened by the burrows of often a half inch or more in breadth that they fall from their own weight or even with a moderate wind—the branches thus broken ranging from a half inch in diameter to more than five inches.

To get rid of this pest, men have been employed during the month of May in collecting and destroying the larvæ that were taken out of the limbs that had broken off as the result of their burrowings. The burrows have also been searched for, and a powerful insecticide, bisulphide of carbon, injected.

The Maple-tree Scale Insect.

Scale insects, or bark-lice as they are frequently called, are common and destructive on many of our shrubs and trees, although they more particularly infest the fruit trees. They multiply rapidly from the hundreds of eggs that are usually hidden beneath a single scale, and, fastening upon the bark to the extent of often covering its entire surface, and thrusting in their proboscis, they feed upon the sap until they greatly impair the vitality of, or wholly destroy, the tree.



One of the largest of these scale-insects, and the most conspicuous, from the snow-white cottony secretion that is thrown out from the lower end of the brown shield-like scale in the month of June for the protection of its eggs and the newly-hatched larvæ, is *Pulvinaria innumerabilis*. The figure accompanying represents it in its occurrence on grapevine, upon which it is often found. It apparently favors the soft maple, *Acer dasycarpum*, but it also occurs on the linden, beech, willow, box-elder, osage-orange, locust, Virginia creeper, etc.

During a few years past this insect has become a great pest in Brooklyn and the vicinity, and has killed a large number of the soft maples of the streets and parks.

At the commencement of attack the scale can be controlled by crushing it by hand when the egg-masses are observed, and before they have given out the young to scatter over the tree. When the tree is badly infested they can be destroyed by spraying with a force pump, using kerosene emulsion, just at the time when the young larvæ have hatched and have not yet fastened themselves to the bark and secured more or less protection from the scale which they speedily secrete for a covering.

The above will serve to call attention to some of our more prominent insect-pests—to show the varied character of their injuries, and methods by

which they may be controlled. There are scores of others which are perhaps equally injurious to the trees of our forests and parks. Their insect enemies are becoming more numerous each year, and more serious in their demonstrations. We already know between five and six hundred distinct species that attack the oak; one hundred on the elm; nearly two hundred on the hickory; over one hundred on the maple; one hundred and twenty-five on the birch; above two hundred on the willow; nearly two hundred on the pine; and hundreds on the other evergreens.

Almost any of these are liable at any time, from peculiar causes, to multiply to an injurious degree. It is, therefore, necessary to give careful study to the life-history and habits of each separate species. This almost illimitable work, to be successful, must be shared by many, and to a cordial and hearty co-operation in it, the aid and assistance of our young people—of all admirers and lovers of trees everywhere—is earnestly invited, that our elms and maples and evergreens of the present may not ere long become only saddened memories, but may continue in even greater number and in additional perfection, under the fostering care of Arbor-day teachings and associations, to shelter, protect, impart health, delight the eye, stimulate the love of the beautiful, and in many ways to ennoble and make better succeeding generations.





WHAT THE BIRDS THINK.

Miss Mary A. McClelland.

Myron A. Cooney.

Allegro.



1. Did you hear the birds at the early dawn? 'Twas a joyous, frolicsome
2. "Ra-ta-ta, ra-ta-ta, ra-ta-ta-ta-ta!" From the woodpecker's rapid



sing-ing; From housetop and treetop and dew-y lawn Their chirp, chirp, chee-ree-ees were ham-mer; A "chick-chick-a-da— chick-a-da-da-da!" And the tit-mouse join'd in the




rall.



ring-ing, The robin awoke the gay bob-o-link The song-sparrow's trill woke the clam-or. "Tut-tur, tut-tut-tur" were the words I heard, "They've chosen from woods and from



pressez un peu.



lin - net ; An o - ri-ole called, "The sky's growing pink, The meeting, the meeting, be - gin it."
gar - den A tree and a flow'r but nev - er a bird! Tut-tur, they must ask for our par - don."

pressez un peu.

Chorus.





Tink - a - link, tink - a - ling, wa - ters are flow - ing O - ver the stones so mer - ri - ly

f




go - ing On thro' the mead - ows where breezes are blow - ing, Tink - a - link, tink - a - ling,

Tink - a - ling.

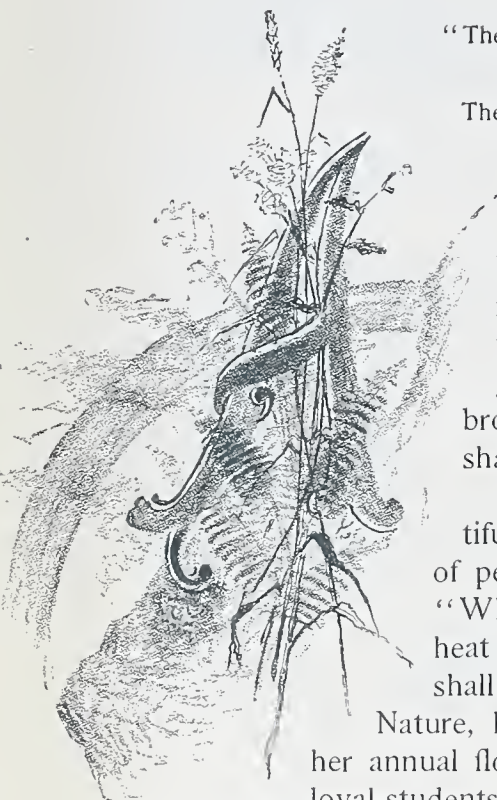
pp *rall.*

3 The bluebird flew off to a hollow tree,
The lark sought her nest in the clover;
The goldfinch repeated her sweet "Ba-bie!"
For the morning meeting was over.
The tidings were carried both far and fast,
To forest and lake-side and river;
To a circling swallow the word was passed,
The quail heard the news with a shiver.



4 Ere the red sun sank at the close of day,
There was held another short sitting;
To this came the doves in their suits of gray,
And the humming birds, flashing and flitting.
"Coo-oo, coo-oo-oo!" 'twas an oversight,
'Tis best not to storm at the people;
You'll see that next summer they'll make all right."
The doves then sailed off to the steeple.





"The winter is over and gone,
The thrush whistles sweet on the spray,
The turtle breathes forth a soft moan,
And the lark mounts and warbles away."

WELCOME to Arbor Day, 1895. A hearty greeting to the day and the celebration thereof. May the thousands of young trees to which it shall give new homes flourish—may their roots spread broad and deep, their growth be rapid and their shade ample.

Again has the beneficent Creator hung his beautiful "bow of promise" on the clouds, the symbol of peace, the renewal of his covenant with man; that "While the earth remaineth, seed time and harvest, heat and cold, summer and winter, day and night, shall not cease."

Nature, his faithful handmaiden, has already inaugurated her annual floral resurrection, and a grand color lesson for her loyal students. She has breathed on the willow, and lo! every spray is golden and throbbing with new life; little gray catkins in their silken sheen are peeping from bursting buds, the prelude to a coming wealth of delicate green. A faint, subtle fragrance betrays the hiding place of the trailing arbutus, where in secret she has fashioned her clusters of dainty pink and white bells and is awaiting the signal to rise, throw off the covering of dry leaves, and display her beauties to the light.

Hepatica, too, has awakened, and is thrusting millions of downy buds through the mould, and unfolding starry blossoms, violet, blue, pink, and white.

Next we see beautiful *Sanguinaria* in spotless purity, each snowy cup half wrapped in a protecting leaf; there *Houstonia*, so divinely blue; the little yellow violet timidly creeping up from her long sleep; *Forsythia* gaily decorating all her twigs with a profusion of golden bloom; the swamp maple blazing red with flaming tufts of fringe-like flowers.

A low refrain is swelling through the forest, from birds and bees and gauzy-winged creatures. Reveling in light and warmth, on they come in troops and tribes, these denizens of spring, each in its appointed time and place, with an offering of beauty or song, anon to retire, to perfect in darkness and silence the order of their brief life.

As spring wanes and summer comes apace, the flowers assume a more brilliant guise. We see the scarlet and gold of the wild columbine, the fiery

red of the cardinalis and the gorgeous-hued peonies. Nature now unfurls her color standard, and the thousands of hues and tints with which she lavishly beautifies her realm are only her skilful blendings of the colors of their great prototype, the rainbow.

As summer glides into autumn, the deepest and richest colors prevail, and dahlias, zinnias and salvias are regal. Shades also mingle in the colorings, and bright purples (vio-blue) and maroons (vio-red) appear.

Asters are in their glory, and dark-hued marigolds, marvelously variegated. Next the deft artist tinges fruits and nuts. At her touch a delicate bloom veils the purple of the grape and plum, a rosy blush creeps over the peach, and red, russet, or gold adorns the apple and other fruits.

Nuts become glossy and shine in ruddy browns. But the whole culminates in the glorious display of autumnal foliage, when mountain, hill and dale are aglow with color and splendor, which neither pen nor brush can portray. But the cycle is completed, the work of the year is done.

As trees and flowers pass into their winter rest, Nature disrobes these children of her care, and, as she lulls them to sleep, gathers all their brilliant colorings and merges them into a mantle of white, which she spreads over the land. She leaves us beauty of another type, the evergreens, with their sombre foliage and graceful forms, to cheer and embellish the snow-covered scene. Emblems of sturdy life, they brave the frost, defy the tempest, and stand as sentinels over the fallen year.

Since color pervades the universe, and Nature is its great exponent, what a grand volume does she unfold for our instruction and delight ; she teaches us that an absolutely colorless object is impossible ; she shows us the endless round of growth and decay in all its phases ; she points to the revolution of the seasons, to the marvelous phenomena of earth, sea and sky, to the starry wonders of the heavens, the roseate hues of dawn and the sunset glow, to the weird tints that play in the lightning and shimmer in the "Aurora Borealis," and tells us that where the Omnipotent reigns, there is beauty.

GRATIA L. RICE,
State Director of Drawing.



THE RED CLOVER.

STATE FLOWER OF VERMONT.

Sweet little red clover !
Thou hast triumphed over
Thy prouder sisters, both fair and grand ;
For thou hast been taken,
And all else forsaken —
The flower of the State, to be loved through the land.

Sweet little red clover !
The bumble-bee, rover
O'er fragrant meadows and fields and dales,
Finds no blossom sweeter,
No beauty completer,
Can mortals like us hope to win where he fails ?

Sweet little red clover !
'Tis tied for thy lover,
That green cravat close under thy chin.
Now do not deny it,
I shall not decry it —
'Tis so the world over, nor is it a sin.

Sweet little red clover !
He still hovers over
Thy pretty form so trim and so slight ;
Why is thy head drooping ?
Why is thy form stooping ?
Right glad shouldst thou be to receive such a knight ?

For clover ! sweet clover !
He loves thee ; moreover,
Such buzz and hum I never did hear ;
Away thou art turning,
With rosy cheek burning —
Pray what is he telling right into thine ear ?

Now little red clover !
Be true to thy lover ;
Make glad and bright the sweet springtime bowers.
Vermont has our greetings ;
May many grand meetings
Come under thy reign as the queen of the flowers !—H. B.

Vermont, our neighboring State, has recently chosen the red clover for her State flower.

To Vermont we send Arbor Day greetings and the little poem which appears above, contributed to our Arbor Day book by one who loves the red clover and has found much pleasure in studying it in its relations with the bumble-bee. We all know the red clover, or think we do, but, as William Hamilton Gibson so prettily puts it in a recent article, "What do we know of the life-secret of this clover, even though that secret is noised abroad in the drone of every bumble-bee in the meadow? Have we thanked him for our red clover? Do we realize that, if our burly bumble-bee were suddenly to perish from the face of the earth, the red clover would die of a broken heart? This bumble-bee is as necessary a part of the plant's life as are its leaves and petals. The flower has decked itself in beauty and fragrance for his coming and blushes for him alone. Its nectar is provided with sole thought of him, and its pink portals are framed to welcome him, above all other insects."

Darwinian science has shown us that, though butterflies of various kinds are fond of the red clover, the flower does not respond to their greeting, as it always does to that of the bumble-bee. This has been illustrated where the clover seed has been imported and sown in countries in which the bumble-bee was unknown, for in harvest time no seeds were found, for the reason that there were no bees to carry on the cross fertilization ; and not until the indispensable bumble-bee had been imported and naturalized did the clover become content in its new home.

There is in all this, perhaps, something for us to observe and study, not alone with respect to the red clover, but it may also open our eyes to many other interesting plants.



Of the elm, one writer says, "To me no other tree seems so beautiful, so majestic." In spite of the fact that we love the maple, since we have chosen it for our State Tree, the elm always appeals to our love of beauty and grace, and we never see one, with its beautiful lines of growth standing out against the sky, but we realize how closely it rivals the maple in our affections.

Henry Ward Beecher classes the elm as first in the whole nobility of trees, and in comparing it with the oak says, "The old oaks of England are very excellent in their way, gnarled and rugged. The elm has strength as significant as they, and a grace, a royalty, which leaves the oak like a boor in comparison. Had the elm been an English tree, and had Chaucer seen and loved and sung it; had Shakespeare and every English poet hung some garlands upon it, it would have lifted up its head now, not only the noblest of all growing things, but enshrined in a thousand rich associations of history and literature."

It is a suggestive fact that the elm bends to the winds which the rugged oak defies, and is, therefore, less often broken by the storms.

Wilson Flagg, in "A Year Among the Trees," tells many interesting facts about elms, of which we mention a few. He remarks that the elm is the most drooping of the drooping trees, with the exception of the willow, which it surpasses in grandeur and in the variety of its forms. It is valued as a landscape ornament above every other species.

The flowers of the elm appear early in April, in numerous clusters, fringing the long terminal spray and filling up the whole space so effectually that the branches can scarcely be seen. They appear at the same time with the crimson flowers of the red maple.

The seeds ripen early, and being small and chaffy are wafted in all directions and carried to great distances by the wind. The beauty of the elm is greatest in June, soon after the leaves are expanded. Then only can its verdure be considered brilliant, for the leaf soon fades to a dull green, and displays no beautiful colors,—merely that of a rusty yellow in the autumn.

The elm generally subdivides into several equal branches, diverging from a common center at a small distance above the ground. The height of this divergence depends on the condition of the tree when it was a seedling, whether it grew in a forest or in an open field; and the angle made by these branches is much wider when it obtained its growth in an isolated situation.

The shapes of different elms vary more than those of any other known species. It is indeed almost the only tree which may be said to exhibit more than one normal figure, setting aside those variations of form which are the natural effects of youth and age. The American elm never displays one central shaft, to which the branches are subordinate, like the English elm; or rather, when it has only a single shaft it is without any limbs, and is surrounded only with short and slender twigs. The normal diversities of shape described by Mr. Emerson are the dome, the vase form, the parasol, and the plume.

A remarkable trait of the elm is that, unlike other trees, it seldom loses its beauty, and is often improved in shape, by growing while young in a dense assemblage. It is simply modified into a more slender shape, usually subdivided very near the ground into several branches that diverge but little until they reach the summit of the wood.

The picture of the distorted elm tree used on the cover of this issue of our Arbor Day Book was kindly furnished us by Mr. Romeyn B. Hough, of Lowville, Lewis County, the publisher of "American Woods." The tree is of the species *Ulmus Americana*, the White Elm, and it is in the town of Martinsburgh, near Roaring Brook, Lewis County. Its distorted condition is no doubt the result of an old custom of making fences through the forest by cutting small trees partially through, and lopping them down along the lines. The custom was common in early days, when the State was generally covered with forests; but many of these interesting trees have managed to raise their heads again and develop tops of considerable size, in spite of the rough treatment they received when young.

***Ulmus Americana*, L.—White Elm.**

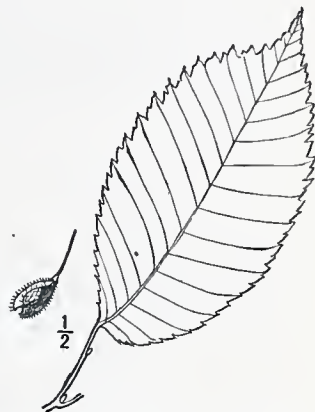
A large, majestic, and well-known ornamental tree, usually with spreading branches and drooping branchlets. Wild throughout, in rich, moist soil, and common in cultivation.

Leaves two to four inches long, oval or obovate-oblong, abruptly pointed, sharply and often doubly serrated, soft-pubescent beneath when young, soon quite smooth; buds and branchlets smooth.

Flowers in loose umbel-like clusters, small and purplish, appearing before the leaves.

Fruit one half inch long, its sharp points incurved and closing the deep notch; hairy only on the edges.

Wood heavy, hard, strong, tough, rather coarse-grained, compact, difficult to split; color, light brown, the sapwood somewhat lighter; largely used for wheel stock, saddle-trees, flooring, in cooperage, and in boat and ship building.



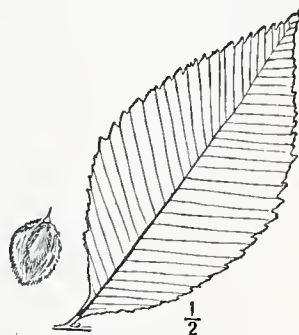
***Ulmus racemosa*, Thomas.—Cork or Rock Elm.**

Smaller tree, with rigid branches, branchlets and bud-scales downy, often with wing-like corky ridges.

Leaves nearly as in the *Ulmus Americana*, but with veins more simple and straight.

Flowers in racemes; fruit large, one half inch or more long, with a deep notch; hairy.

Wood heavy, hard, very strong, tough, very close-grained, compact, susceptible of a beautiful polish; color, light clear brown, often tinged with red, the thick sapwood much lighter; largely used in the manufacture of heavy agricultural implements, wheel stock, bridge timbers, etc.



***Ulmus fulva*, L.—Red or Slippery Elm.**

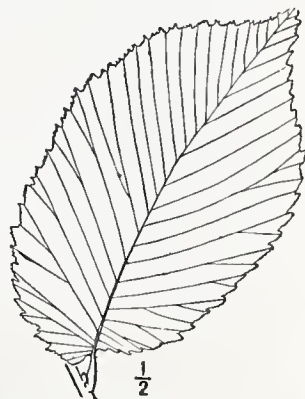
A medium-sized tree, wild, in rich, low grounds. Young branches downy; buds in spring soft and downy with rusty hairs. Inner bark very mucilaginous.

Leaves large, four to eight inches, very rough above, ovate-oblong, taper-pointed, doubly serrate, soft-downy beneath; sweet scented in drying.

Flowers reddish, seven-parted, sessile, in dense clusters. Calyx hairy, soft-downy underneath or slightly rough downwards.

Fruit with a shallow notch in the wing, not nearly reaching the rounded nut.

Wood heavy, hard, strong, very close-grained, compact, durable in contact with the ground, splitting readily when green; color, dark brown or red, the thin sapwood lighter; used for wheel stock, fence-posts, rails, railroad ties, sills, etc.



SUGGESTIONS FOR PROGRAMMES FOR ARBOR DAY.

"Go higher and higher and higher, the highest is ever the best!"

We give below some suggestions which may be used in arranging programmes for Arbor Day. This is done at the request of many who would like to know just what to do and what others are doing. Of course, such matter will be taken from these suggestions as may be adapted to the age of the pupils. The purpose should be to lead the children to a more direct and practical study of nature along the lines indicated. Make the very most of the day, but do not let the close of Arbor Day end the work for which the day was set aside.

1. Song—Something appropriate to the day.
2. A familiar talk on Arbor Day, its institution, purpose, etc., or this may be embodied in a paper read by some pupil. In connection with this may be taken up a consideration of the work done on previous Arbor Days, the trees planted, how many survive at the present time in good condition, etc. This might lead up to a discussion on the care of trees, plants, etc., for which the teacher should have the children prepare themselves.
3. Reading of State Superintendent Crooker's letter to the children, either by a pupil or by the teacher.
4. Something about our State tree and State flower, to be taken from former Arbor Day books, if desired, or better still, have pupils bring in facts which they themselves have discovered about the maple and the rose. Encourage original investigation.
5. The Arbor Day Song—"What the Birds Think."
6. Reports concerning birds which have been observed previous to Arbor Day—their appearance, habits, where and how they build their nests, their songs or notes, when first seen, etc., etc. An expression of the pupils' favorite birds, and the reasons why, as following out the suggestions made in the Arbor Day Song. Spice may be added to this exercise if the children carry on a secret investigation, to be reported only on Arbor Day; also, if they can be led to express in pictures what they have seen. This idea may also be carried out in regard to flowers, trees and insects. Let each child bring in one discovery made by himself; for instance, the first flower to blossom, the color of the leaves on opening, etc., etc.
7. Poem—"Nature's Awakening," by Sarah C. Flint.
8. Article on "How to Know Trees," by Austin C. Apgar, explained and illustrated by charts or drawings. This may be made so interesting that the children will be ready and anxious to take up the collection and classification of leaves immediately. It might be well to have the children bring in specimens of trees at this time, and show them how to proceed.
9. Some appropriate quotations, for which the following may be used, if desired:

Now is the time
To visit Nature in her grand attire.

The little birds sang as if it were
The one day of summer in all the year,
And the very leaves seemed to sing on the trees.

—LOWELL.

I learned all weather signs of day and night ;
No bird but I could name him by his flight.
— LOWELL.

“The lovely wild flowers,” says Jean Ingelow,
“Are the flowers which God made.”

Thoreau says of Spring,— “March fans it, April
christens it, May puts on its jacket and trousers.”

There was never mystery
But 'tis figured in the flowers ;
Was never secret history
But birds tell it in the bowers.
—EMERSON.

A little helpless, innocent bird,
That has but one plain passage of few notes
And sings the simple passage o'er and o'er.
—TENNYSON.

But in the bleak December,
One only can remember
May, sweet May,
The sweetest name to say.
Sweet are the thoughts of her
As rose leaves in a jar!
—KATHARINE TYNAN HINKSON.

10. Poem.

A GARDENER SAGE.

From "Cuckoo Songs," by permission of the Publisher, Copeland & Day.

Now, here's a curious thing :	But then — the wonder's big !—
Upon the first of March	<i>If Sunday fell that day,</i>
The crow goes house-building	<i>Nor straw, nor scraw, nor twig,</i>
In the elm and in the larch.	<i>Till Monday would he lay.</i>
And be it shine or snow,	His black wings to his side,
Though many winds carouse,	He'd drone upon his perch,
That day the artful crow	Subdued and holy-eyed
Begins to build his house.	As though he were at church.

The crow's a gentleman
Not greatly to my mind,
He'll steal what seeds he can,
And all you hide he'll find.
Yet though he's bully and sneak,
To small birds bird of prey —
He counts the days of the week,
And keeps the Sabbath Day !
— KATHARINE TYNAN HINKSON.

11. “Our Native Elms.”—Extracts read and the differences between the three native elms explained and illustrated by specimens and drawings, so that every child may know them.

12. Poem.

COMFORT.

(TO A BIRD.)

From "Cuckoo Songs," by permission of the Publisher, Copeland & Day.

*O my blackbird might grow pale,
Just to hear the nightingale.*

Be not troubled, golden-throat,
He is singing, far away
In a country dim, remote,
Singing twixt the dark and day.
Sleep, sweet, in your house of wattle,
By your tender mate and true;
Till 'tis time to call the cattle
From their dreams in grass and dew.
Should you ask her, she will swear
There was never a voice like yours,
Nor such coat of silk and fur,
Nor such bright eyes full of lures.

So sing songs to your brown sweeting,
Let no cares disturb your rest,
While below her fond heart beating
Speckled eggs are in the nest.

You've a house, and a house-mate,
Feathered daughters and a son;
So your duty to the State,
As bird-citizen you have done.
Therefore shall he keep you waking?—
That brown bird of night, afar,
Singing songs, divine, heart-breaking,
Of a bird's love for a star.

*Yet my blackbird might grow pale,
Just to hear the nightingale.*

—KATHARINE TYNAN HINKSON.

13. Reading of article on Nature's Color Lesson, by Gratia L. Rice.

14. "Some Destructive Shade Tree Pests"—Reading of extracts from Dr. Lintner's article. The various insects may be discussed by different pupils and made very interesting by copying on the blackboard the illustrations of them, that all may learn to recognize them and may assist in destroying these pests.

15. Poem—"The Red Clover"—The State Flower of Vermont—with accompanying note.

16. We give below two other poems which may be suitable for recitation—:

WINTER.

The white of the snow is enchanting ;
Tell not of the ice-tree in words ; [sleigh,
There is joy in the bells of the snow-crunching
In the ruddy cheek and the laughter gay,
But I long for the song of the birds.

The nimble titmouse is cheery,
The woodpecker's screech I have heard,
The little gray sparrows from over the sea
Chirp out a wee morsel of solace to me,
But not as the song of a bird.

Is summer real and coming,
With its waving green and its herds?—
For the greatest good the winter can bring
Is the hope in me of returning spring,
And the joyous song of the birds.

—W. G. BARTON.

MORNING GLORIES.

Deftly twisted, dainty spiral,
Drawing in the sunset glow,
Spreading it with softened tintings
O'er thy petals' face of snow ;
Nodding in the gentle zephyrs,
Catching in thy half-lit cell
All the south wind's sweetest music
As from ocean old the shell ;

Waiting, closed, until the moonlight
Yellow grows at touch of dawn,
When, untwisting, thou becomest
The full glory of the morn.
I half think that at their opening
When those sunset colors show,
Then the south wind's treasured music
From each fairy horn doth flow.

And a man with worthy motives,
Listening much, and patient more,
Might receive sweet elfin concord
From the vine about the door.

—W. G. BARTON.